AT-MX381 SmartMixer®

Eight-channel Automatic Mixer

Audio-Technica's AT-MX381 SmartMixer is a microprocessor-controlled, programmable, automatic-switching eight-channel audio mixer designed to improve audio quality in broadcast, sound-reinforcement and recording applications. One of the ways it achieves this is by keeping the number of open microphones to a minimum, thus reducing background noise, feedback and other distractions, while providing instant, completely transparent switching between channels.

For use with low-impedance dynamic and condenser microphones (including wireless microphone systems), as well as with line-level sources, the AT-MX381 automatically gates microphones on and off for the best possible audio quality.

Each of the AT-MX381 SmartMixer's eight balanced inputs provides switchable 48-volt phantom power; attenuation is also selectable on each input to allow use with line-level signals. A direct output connection is available for each input, for use with logging recorders and other devices. To custom-tailor conferencing needs, the mode of each microphone channel can be independently switched. The combination of switch settings results in three different modes of priority selection/operation. A selectable "last mic on" feature keeps the most recently used microphone on for continuous room ambiance.

Up to 16 AT-MX381 SmartMixers (a total of 128 channels) can be daisy-chained via the included Link Cable, for large multi-mic installations.

In a multiple-microphone system, as more microphones are turned on, the increased system gain can be a potential source of feedback. The selectable NOMA (Number of Open Microphones Attenuated) feature helps control feedback by compensating for the increase in system gain. A built-in algorithm in the AT-MX381 recognizes how many microphones are "on" and automatically adjusts the system gain accordingly.

If automatic functions are not desired, the AT-MX381 SmartMixer can function in manual mode, bypassing the mixer's automatic switching and attenuation functions, causing the unit to behave like a conventional mixer.

The AT-MX381 includes two separate external control systems: Individual-channel contact closures (via DB25 connector) and PC control (via RS232 connector). The RS232 connector can also be used to connect an external control system (Crestron® or AMX®) using "open disclosure communication protocol" to control the SmartMixer.

AT-MX381 Features

- **Eight balanced inputs allow use with both mic- and line-level signals**
  Each input provides:
  - **48V phantom power (individually selectable)**
  - **Individual gain, threshold and sound volume controls**
  - **Gate attenuation (adjustable 0 dB to full mute in steps of 12 dB)**
  - **Low-cut filter (individually selectable via SmartMixer Software) to minimize the pickup of undesirable noise**
- **NOMA (Number of Open Mics Attenuated) (selectable)-Automatic gain adjustment as each microphone is activated**
- **Selectable manual mode overrides automatic functions**
- **Selectable hold time allows mics to stay on during brief pauses in conversation**
- **Priority pre-select feature allows priority of each microphone to be independently assigned**
- **Last Mic On keeps the most recently used microphone on for continuous room ambiance**
- **Linking capability for 16 units (up to 128 channels)**

- **External control capability enables the SmartMixer to activate other devices:**
  - **"Force-On"- allows an external contact closure to force its associated input to turn on**
  - **"Force-Off"- allows an external contact closure to force its associated input to turn off**
  - **"Control Voltage Out"- a voltage appears when the associated input's gate opens or turns "on"**
- **Two audio outputs (one balanced, one unbalanced) are provided to drive amplification systems or other equipment**
- **An RS232 data port provides a connection point for a PC computer running the SmartMixer Software to configure key operating functions**
- **Compatible with Crestron® and AMX® systems**
- **Output level meter**
- **Monitor headphone output with level control**
- **Basic functions are configured via front panel; detailed settings through SmartMixer Software**
- **Mounts in a single 19" rack space via integral rack mount**

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Architects and Engineers Specifications

The SmartMixer shall be a microprocessor-controlled, programmable, automatic-switching eight-channel audio mixer. It shall be suitable for use with low-impedance dynamic and condenser microphones (including wireless microphone systems), as well as with line-level input sources. The SmartMixer shall be equipped with eight balanced inputs, each providing switchable 48-volt phantom power. Independent input trim (for gain setting) and channel level controls shall be provided for each input allowing the SmartMixer to accept a wide variety of microphone- and line-level signals. A low-frequency roll-off filter shall be provided on each input to tailor the sound to minimize the pickup of unwanted mechanical noise. Each input shall be provided with an input gate/overload indicator to show channel gate status or input overload. Input and output connections shall be via standard Phoenix-type connector blocks. Mating connectors shall be included with the SmartMixer. A direct output connection shall be available for each input. This connection shall be configurable to output signal before or after the channel's gate. The mixer shall be designed to operate in one of three priority configurations allowing certain inputs to have priority over other inputs. It shall be possible to independently configure the setting of each input channel, for one of the priority modes. Any number of channels can be given priority over other channels for maximum operational flexibility. An adjustable master threshold control shall be provided to allow for setting the point at which the gates are triggered. Front panel status indicators shall be provided showing attenuation status, Mic/Line input selection and channel priority mode. A dedicated LED shall indicate manual or automatic mode. The mixer shall allow for last microphone on operation. In this mode, the last active microphone shall stay active (on) so that ambient sound is never muted. The time that the mixer keeps a channel's gate open shall be configurable from 0.5 to 3.0 seconds. The unit shall offer a selectable NOMA (Number of Open Microphones Attenuated) feature to help control feedback by compensating for the increase in system gain based on the number of active (open) microphones. The SmartMixer shall offer a manual mode, which bypasses the mixer's automatic switching and attenuation functions. The SmartMixer shall provide external contact closures and logic control outputs to enable the mixer to interface with external devices for control and status indication via a standard DB25 connector. An RS232 computer interface control connector shall be provided for connection of a computer system for configuration and programming. In addition, the RS232 connector may be connected to an external control system (Crestron® or AMX®) using standard "open disclosure communication protocol" to control the SmartMixer. Configuration software shall be provided with each SmartMixer. It shall be possible to configure an entire linked system from one SmartMixer (master). The software shall be graphical in nature, operating on the standard Windows™ operating system.

Two audio outputs (one balanced, one unbalanced) shall be provided to drive amplification systems or other equipment. A master output control shall be provided to set the overall level of the SmartMixer. An adjustable limiter shall be provided on the main output to prevent overdriving. A front panel headphone jack with level control and an LED output level indicator shall be provided to monitor the audio output of the SmartMixer. It shall be possible to select the output indicator function pre or post master level control.

Up to 16 SmartMixers (a total of 128 channels) may be daisy-chained for large multi-mic installations. When operating in this way, the output for all of the linked mixers appears at the master mixer in the chain. Last mic on, NOMA and other configuration settings shall cascade through the entire chain of linked mixers. Each mixer shall include the cable for linking units together.

The SmartMixer shall be designed to mount in a standard 19" equipment rack occupying no more than one rack space. Rack ears shall be integral to the unit. All system settings shall be possible via front panel controls or software programming without having to remove the mixer from the rack. A security cover shall be available to prevent unauthorized tampering with front panel controls and it shall be possible to lock out programming functions via the software or front panel switch sequence.

The SmartMixer shall be designed with a universal internal power supply enabling it to operate internationally on any global power system. It shall be provided with proper IEC type mains power cable specific to its location and an RS232 computer interface cable for programming (North America only). Units that require wall warts or external power supplies shall not be accepted.

The SmartMixer shall be an Audio-Technica AT-MX381 or equivalent.

Specifications†

Input Impedance:	
Mic Level	6600 ohms
Line Level	8500 ohms
Output Impedance:	
Balanced	
Line Level	300 ohms
Mic Level	350 ohms
Unbalanced	400 ohms
Direct Output	60 ohms
Maximum Input Level:	-50 dBu (gain at Max)
Maximum Output Level:	22 dBm (THD+N at 1%)
Equivalent Input Noise Level:	-130 dBu*
Total Harmonic Distortion:	>0.3% (channel gain at max)
Maximum Gain:	69 dB
Frequency Response:	20 to 20K Hz (±3 dB)
Microphone Phantom Power:	+48V DC
Control Voltage Out:	+4V DC
Maximum Monitor Output:	50mW (@ 1% THD+N) with 16 ohm load
Power Supply:	100/240V AC (auto-select), 50/60 Hz, 20W
Operating Temperature:	32° to 104° F (0° to 40° C)
Dimensions:	16.93" (430 mm) W x 9.05" (230 mm) D x 1.75" (44 mm) H (not including feet, knobs and connectors)
Weight:	8 lbs. 6 oz (3.8 kg)

† In the interest of standards development, A.T.U.S. offers full details on its test methods to other industry professionals on request.
* Input terminated with 150 ohms, A-Weighted using Audio-Precision System Two.

Visit www.audio-technica.com for extensive information on the AT-MX381 SmartMixer

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